

Amendments to the Specification:

Please amend the specification as follows:

[0001] The present disclosure is related to the following commonly-assigned co-pending U.S. Patent Applications: No. 60/384,663 (Attorney Docket No. NVDAP000374US), filed May 31, 2002, entitled “Method and Apparatus for Display Image Adjustment”; and provisional application No. 60/463,759 (Attorney Docket No. NVDAP000772US), filed April 17, 2003, entitled “Method and Apparatus for Display Image Adjustment”. The respective disclosures of these applications are incorporated herein by reference for all purposes.

[0054] In one embodiment of the present invention, a projected image such as image 301a is corrected for both keystone distortion and nonuniform brightness. Examples of techniques for adjusting the image shape to compensate for keystone distortion are described in detail in the above cross-referenced application No. 60/384,663 (Attorney Docket No. NVDAP000374US). In one example described therein, the underlying image (including, e.g., desktop and/or other data) is converted to an image texture that is blended onto a target surface, similarly to steps 206, 208, and 210 of process 200 described above. Initially, the target surface corresponds to the dimensions of the viewable area. A user can adjust the shape of the projected image by modifying the target surface.

[0061] At step 404 a target surface is defined, e.g., using one or more polygons, similarly to step 208 of process 200 described above. In one embodiment, the target surface is defined using a polygon mesh. For projection onto a flat screen, a rectangle or as few as two triangles may be used; larger numbers of polygons may advantageously be used to support projection onto a non-flat surface, e.g., into a corner or onto a cylindrical, spherical, or other curved surface. Specific examples of polygon meshes suitable for such surfaces are described in the above-mentioned application No. 60/384,663 (Attorney Docket No. NVDAP000374US).

As described above, defining the target surface advantageously includes establishing a mapping between selected points (e.g., vertices of polygons) of the target surface and selected texture coordinates or texels of the image texture. The target surface may be assigned a color value, such as solid black (or other solid color). At step 406, the image texture is texture-blended onto the target surface. This step may be implemented similarly to step 210 of process 200.

[0062] At step 408, a user interface is displayed, enabling the user to modify the shape of the target surface to correct for keystone distortion. In one embodiment, the user interface includes a set of movement handles as illustrated in Fig. 3B and described above. The handles advantageously correspond to some or all of the vertices of the polygon or polygon mesh used to define the target surface. The user interface is advantageously activated and deactivated in response to appropriate user input. For instance, a user may be able to toggle the interface on and off by pressing a designated key or sequence of keys, by choosing an item from an on-screen pop-up menu, and so on. Further details and examples related to the user interface may be found in the above-referenced application No. 60/384,663—(Attorney Docket No. NVDAP000374US).

[0067] It will be appreciated that the process described herein is illustrative and that variations and modifications are possible. Steps described as sequential may be executed in parallel, order of steps may be varied, and steps may be modified or combined. For example, shape correction may be done without luminosity compensation, and/or luminosity compensation may be done without shape correction. The luminosity masks and texture blending steps described herein may also be employed in conjunction with other techniques for keystone (shape) adjustment, numerous examples of which are described in the above cross-referenced patent application No. 60/384,663—(Attorney Docket No. NVDAP000374US).

[0074] In a further embodiment of the present invention, a luminosity mask is used to reduce visible seams between sections of a composite image. In this embodiment, an array of display devices (e.g., projectors or CRT monitors) is set up and used to display an image, with each device displaying a portion of the image. Examples of such systems are described in detail in the above-referenced application No. 60/463,759—(Attorney Docket No. NVDAP000772US).

These systems include various features for synchronizing and aligning devices that display different portions of the image; such features are not crucial to understanding the present invention, and a detailed description is omitted.

[0075] Fig. 6 shows an example of an image 600 displayed by an array of M by N projectors (not shown), each of which projects a corresponding element (or portion) 601(i, j) of the image 600, where $1 \leq i \leq M$ and $1 \leq j \leq N$. At least one of M and N is greater than 1; the other of M and N may be equal to 1 or greater than 1. To reduce or eliminate perceptible gaps between adjacent image elements, e.g., elements 601(1,1) and 601(1,2), it is useful to have the projectors display overlapping sections of the image. For instance, the projector that displays image element 601(1,1) may display all pixels in a rectangle defined by top edge 621, left edge 623, horizontal dashed line 612, and vertical dashed line 611. Similarly, the projector that displays image element 601(1,2) may display all pixels in a rectangle defined by top edge 621, horizontal dashed line 612, and vertical dashed lines 613 and 614. Thus, overlap regions such as regions 616 and 618 are created. An overlap region may exist anywhere two or more image elements form a seam. The size of the overlap regions may be user-adjustable, as described in the above-referenced application No. 60/463,759 (Attorney Docket No. NVDAP000772US).

Please add the following new paragraph after paragraph [0011] and after the heading “BRIEF DESCRIPTION OF THE DRAWINGS”:

[0011.1] The patent contains two drawings (FIGS. 8A and 8B) executed in color. Copies of this patent with color drawings will be provided by the Office upon request and payment of the necessary fee.

Amendments to the Drawings:

Original Figs. 8A and 8B, which depict a luminosity mask and a corresponding displayed image according to an embodiment of the present invention, as photocopied on a conventional copy machine were too dark. Applicants are submitting color copies, in triplicate, of these figures which accurately depict the screen shots. This sheet, which includes Figs. 8A and 8B replaces the original sheet including FIGS. 8A and 8B.

Attachment: Replacement Sheet (in triplicate) in color of FIGS. 8A and 8B
Black and white photocopy of Replacement Sheet